

SECTION 11. TELECOMMUNICATION STANDARDS

This section describes telephone, pre-wiring, computer support, and other communication requirements that must be addressed in the project design. These criteria are as follows:

11.1 CATV

Century Communications is the current base-wide cable TV contractor. All components of the on-base distribution system are owned and maintained by the base wide cable TV contractor. This includes cable, amplifiers, splitters, etc. installed within the building. New construction and remodeling projects should make provisions for conduit, outlets, lockable enclosures, power and building entrance. However, in all cases the contractor is liable for a complete and functional system.

11.2 PHONE STANDARD

Phone standard is Type A.

11.3 INTRA-BUILDING WIRING

INTRA Building Wiring Policy - Follow requirements of Engineering Technical Letter (ETL) 87-9.

11.4 GENERAL COMMUNICATIONS - COMPUTER SYSTEM REQUIREMENTS

Computer System requirements (C-CS) are as follows:

A 3 meters by 3.5 meters (10 feet by 12 feet) Communication Equipment Room (CER) is required for a facility that has significant communications systems (C-CS) requirements. Unoccupied facilities and small facilities such as guardhouses, utility control buildings, storage bunkers, etc. will normally not require a CER. The CER normally serves as the entrance facility for all incoming C-CS ducts and service and as the main location for C-CS equipment such as PABXs, electronic key systems, main LAN hubs/routers/servers, etc. All CER spaces shall be environmentally controlled spaces, to be maintained at the same temperature conditions as occupied administrative areas..

11.4.1 Location

The CER should be located on the first floor with an exterior wall and be provided with double doors (recommended door size: 1.8 meters wide by 2.4 meters high (6 feet wide by 8 feet high)) without a center support to ensure that large equipment can be easily moved in the room. CERs and telecommunications closets (TC) must not be collocated with other building utility services such as HVAC, Generators/Transformers, etc. due to the sensitivity of newer C-CS equipment to Electro-Magnetic Interference.

11.4.2 Power

The CER must have adequate power to support the C-CS equipment. In addition to normal power outlets, the CER requires 1 quad 20 amp dedicated branch circuit next to the backboard, and 1 quad 20 dedicated branch circuit next to the racks. The designer should coordinate power requirements with the base C-CS personnel and/or the Designated Engineering and Installation (E&I) group. In addition, the room should also have normal convenience outlets on all walls in accordance with NEC and/or local code requirements.

11.4.3 Supporting Structures

As a minimum requirement, the CER should have ¾-inch plywood backboards on all walls, from no greater than one foot above the finished floor level to no less than 2.1 meters (7 feet) above the finished floor level. Depending on the C-CS requirements, a floor mounted main distribution frame (MDF) may be required to support cable terminations.

11.4.4 Grounding

Grounding IAW ETL 90-6, must meet the appropriate NEC requirements and practices. As a minimum, provide a single-point ground for all Communications-Electronics equipment for the building within the CER. Provide a copper ground plate (bus bar with minimum 5 cm wide by 61 cm long (2 inches wide by 24 inches long) in the CER with 2.5 cm (1-inch) standoffs. The ground plate will be installed 2.1 meters (7 feet) above ground level on a wall (preferably an outside wall) within the CER. Provide a ground riser with a No. 1 or larger wire directly connected to the provided ground plate with no taps. The resistance of the ground riser must be 5 ohms or less measured for the main ground point. All connections of wire-to-wire and/or wire-to-ground rod must be cadwelded. The designer should coordinate with the base Communications-Computer Systems Officer (CSO) for communications equipment that needs more specific grounding.

11.4.5 Size Requirements

Table 1. CER Size Requirements

Building Usable Square Meters (Sq. Ft.)			CER Size Sq. Meters (Sq. Ft.)	# of Entrance Conduits
	<	1,858 (20,000)	37 (400)	2
1,858 (20,000)	to	9,290 (100,000)	46 (500)	4
9,290 (100,000)	to	18,580 (200,000)	84 (900)	5
Every Add'l 18,580 (200,000)			+ 56 (+ 600) increment	-1

(Not less than 2:1 ratio Length to Width)

11.5 TELECOMMUNICATIONS CLOSET (TC)

A telecommunications closet (TC) is required for each floor with 929 square meters (10,000 sq. ft.) of usable building footage in a facility. A TC serves as the interface from the CER to the individual voice/data outlets in the facility and as a location for enterprise hubs for data LAN equipment. Note the CER may also function as a TC for the area in the facility where it is located.

11.5.1 Location

The TC should usually be located close to the center of the area it serves. The critical item relative to the location is that the installed length of all distribution cables (horizontal cables) run from the TC to the outlets must be less than 90 meters (295 feet) to support LAN data requirements.

11.5.2 Power

Each TC should have at least two 20 amp dedicated branch circuits to support data hubs, but can be greater depending on the planned equipment for the room. The room should also have normal convenience outlets on all walls in accordance with NEC and/or local code requirements.

11.5.3 Supporting Structures

The TC should have ¾-inch plywood backboards on all walls, from no greater than one foot above the finished floor level to no less than 2.1 meters (7 feet) above the finished floor level.

11.5.4 Grounding

Grounding must meet the appropriate NEC requirements and practices. As a minimum, provide a No. 6 ground wire or larger connected with a direct home run to the ground

plate in the CER. This grounding must be 10 ohms or less measured at the grounding point.

11.5.5 Size

Minimum size for a TC is 3 meters by 3.5 meters (10 feet by 12 feet); however specific dimensions could vary depending on the type of facility. Contact Base Civil Engineering for any variances. The TC size should be provided in accordance with (IAW) EIA/TIA-569, Chapter 7, Table 7.2-1.

11.6 ENTRANCE FACILITIES

All facilities should have entrance conduit into the CER with the minimum number as indicated in Table 1. One of the ducts requires two 5 cm (2-inch) inner-ducts, and one of the ducts requires four 2.5 cm (1-inch) inner-ducts; the rest are spare. If the general area where the new facility will be located is served by a manhole (MH) and duct system, or if the impact of the new facility will greatly develop the area, then a new MH/duct system should be designed to connect the facility to the existing MH/duct system. See the referenced USAF/LEE letter for additional guidance. For projects where an extensive new MH/duct system will be required, it is critical that the appropriate E&I agency be consulted as soon as possible in the design definition process.

11.7 WIRING

11.7.1 Voice

All voice wiring should meet the minimum EIA/TIA Category 5 requirements. Consult with the base CSO for outlet type requirements such as RJ-11 vs. RJ-45 jacks for voices and whether there are any special keying or wiring requirements. The voice riser cable from the CER to each TC should be sized at a minimum of 30% of the total pair distribution planned for the TC rounded up to the next 100 pair count. The riser conduit design should include spare capacity for a second riser cable of equal size.

11.7.2 Data

All copper data wiring should meet the minimum EIA/TIA Category 5 requirements. All fiber cabling should meet the minimum ANSI/EIA/TIA/492AAA requirements. Installed length of copper data cables must be less than 90 meters (295 feet). The minimum size fiber optic riser cable from the CER to each TC is 6 strands. Coordinate with the base CSO for additional requirements. The riser conduit design should include spare capacity for a second fiber optic cable of equal size.

11.7.3 Outlets

The design should provide for an outlet box and wiring to support two voice, two data, and future fiber optic cable outlets every 9.3 square meters (100 square feet) of usable floor space. The designer should coordinate outlet requirements with the base CSO. In areas where conduits are used, the minimum size to serve a single outlet box should be 2.5 cm (1-inch) diameter to allow installation of copper and fiber optic cable. Pinouts for the voice and data jacks will conform to the EIA/TIA 568A standard.

11.7.4 Secure Wiring

All secure communications requirements should be wired IAW AFSSI 30-30, and AFSSM 70-11.

The figure shown on this page, extracted from EIA/TIA-569 Figure 2.2-1 Intrabuilding Elements, illustrates the typical relationships between the major telecommunications pathway and elements within a building.